Prevalence of gastrointestinal nematodiasis in goats

Jupaka Shashank, S Ayodhya, P Nagaraj and N Krishnaiah

Abstract

368 goats that were presented to the Campus Veterinary Hospital and Ambulatory Clinical Services, Mylardevpally, College of Veterinary Science, Rajendranagar, Hyderabad, from December-2017 to June-2018 were selected and screened for gastrointestinal nematodal infestation by different techniques (gross, direct faecal smear, sedimentation and flotation), out of which 140 goats (38.04%) were found positive for gastrointestinal nematodal infestation. The different parasites reported with their respective prevalences were: 88 (62.86%) goats showed Strongyles spp., 33 (23.57%) showed Trichuris spp. and 19 (13.57%) showed Strongyloides spp. on direct smear, sedimentation and flotation techniques. The prevalence of gastrointestinal nematodes with respect to age (categorized as 0 month -1 year, between 1-2 years, between 2-4 years and more than 4 years), and sex were studied.

Keywords: Strongyle spp., Trichuris spp., Strongyloides spp., age, sex

Introduction

India, as a tropical country, has a wide range of climatic zones, which make it vulnerable for a diverse range of parasites of medical and veterinary importance, whose transmission and geographical distribution are closely linked to regional temperature, rainfall and humidity. Small ruminants like sheep and goat occupy an important economic and ecological niche in agricultural systems throughout developing countries (Devendra, 2005) [6].

Goats are one of the earliest domesticated ruminants, which have served mankind as food animal longer than cattle and sheep (Dubey et al., 2012) [7]. Over 94% of the goat population of the world was distributed in two continents namely Asia and Africa (Acharya, 1992) [11]. South Asian countries specially India, Bangladesh and Pakistan are the major producers of goat milk and a well-developed dairy goat industry was observed in European countries like France, Greece, Spain and Italy. Goats are considered as poor man’s cow and has enormous potential to boost economy of developing countries like India and act as a major source of income especially to marginal farmers and landless labourers. However goats are vulnerable to various parasitic diseases that not only undermine their health but also play a role in lowering the overall production rate (Sanyal, 1996) and are responsible for causing heavy losses due to reduced production, morbidity and mortality in animals especially in developing countries (Nwosu et al., 2007) [14].

Parasitic gastroenteritis caused by gastrointestinal nematodes pose a serious health threat and a limitation to the productivity of goats due to the associated morbidity and mortality (Nwosu et al., 2007; Bandyopadhyay et al., 2010) [14, 4]. Infestation in the gastrointestinal tract with parasitic nematodes is still one of the main constraints to dairy specially goat production (Rinaldi et al., 2007) [17]. Further, goats are more susceptible to infestation with gastrointestinal nematodes than sheep (Jallow et al., 1994) [10].

Materials and methods

The present investigation was carried out in the Department of Veterinary Medicine and collaboration with the Department of Veterinary Parasitology, college of Veterinary Science, Rajendranagar, Hyderabad.

Collection and analysis of faecal samples

Faecal sample of about 5 gm from each animal was collected in a zip lock cover from individual goats per-rectally with faecal scoop (Fig. 1). The collected samples were observed grossly for the presence of round worms followed by their qualitative examination for the presence of nematodal ova by taking small amount of faeces on to the glass slide, mixed with normal saline and prepared a thin smear and examined under low power by applying coverslip.
Then the sample was subjected to sedimentation and centrifugal flotation techniques (Sloss et al., 1994) and eggs were identified by morphology (Soulsby, 1986).

![Fig 1: Collection of faeces per rectally](image1)

The faecal samples of goats that were positive for nematodal eggs were considered for the present study.

**Results and Discussion**

Out of 368 goats examined for gastrointestinal nematodal parasitic infestation by screening the faecal samples for the presence of nematodal parasitic ova, 140 goats were found positive, with an incidence of 38.04% in the present study. These findings were almost in accordance with Nabi et al. (2014) [13], who reported that the overall incidence of gastrointestinal nematodal parasite was 40.67% in goats of Pakhtunkhwa, Pakistan. However Akhter et al. (2011) [3] reported 43.10% of overall incidence of gastrointestinal nematodal infestation in goats, which was slightly higher than the present study. Yadav and Tandon (1989), Yusof et al. (2016) [24] and Tariq et al. (2010) [22] reported that the incidence of gastrointestinal nematodal parasitic infestation as 86.8%, 52.3% and 54.3%, respectively, which were found to be much higher than the incidence in the present study.

The differences in overall incidence of gastrointestinal nematodal infestations might be due to variation in agro-ecology, which could affect survival and development of infective larval stage of nematode parasites. Variation in the use of anthelmentics and grazing practices might also contributed for the difference in the incidence (Getachew et al., 2017) [9].

Among the 140 goats found positive for parasitic ova, 88 (62.86%) goats were showed positive for *Strongyles spp.*, 33 (23.57%) were positive for *Trichuris spp.* and 19 (13.57%) were positive for *Strongyloides spp.* on direct smear, sedimentation and flotation techniques. During the present study, *Strongyles spp.* (fig. 2) infestation was found more common in goats followed by *Trichuris spp.* and *Strongyloides spp.* (fig. 3 and 4), and similar findings were reported by Akhter et al. (2011) [3], Tariq et al. (2010) [22], Nabi et al. (2014). On contrary to the present findings Singh et al. (2015) [20] reported that the prevalence of *Strongyloides spp.* was more than *Trichuris spp.* in goats.

Out of 140 positive samples for nematodes in the present study 119 (85%) samples had single nematodal parasitic infestation, whereas 21 (15%) had mixed nematodal parasitic infestation. In the present study the single gastrointestinal nematodal infestation was found more than mixed infestations and similar findings were reported by Akhter et al. (2011) [3] and Zeryehun et al. (2012) [25]. However, Pant et al. (2009) observed mixed gastrointestinal nematodal infestations were more in goats.

Among the 119 goats with single nematodal parasitic infestation in the present study, 72 (60.50 %) were *Strongyles spp.*, 27 (22.69 %) were as *Trichuris spp.* and 20 (16.81 %) were *Strongyloides spp.*, among 21 mixed nematodes parasitic infestations, *Strongyles spp.* + *Trichuris spp.* was noticed in 13 (61.90%) goats and *Strongyles spp.* + *Strongyloides spp.* in 08 (38.1%) goats. In the present study the prevalence of mixed infestation of *Strongyles spp.* and *Trichuris spp.* was found to be higher when compared to the other mixed gastrointestinal nematodal infestation. Which was in agreement with that of Zeryehun et al. (2012) [25] and Akhter et al. (2011) [3], who also recorded similar higher prevalence of mixed infestation of *Strongyles* and *Trichuris* (3.38%), when compared with other mixed gastrointestinal nematodal infestations.

Hence, it may be prudent to conclude that goats might harbour more than one species of gastrointestinal nematodal parasites and treatment should be aimed at mixed gastrointestinal nematodal infestations on proper identification of parasites.

![Fig 2: Strongyle spp. ova (40X)](image2)

![Fig 3: Trichuris spp. ova (40X)](image3)
In the present study, the goats were divided into 0-1, 1-2, 2-4 and >4 years age groups. Among the 140 goats found positive for gastrointestinal nematodes, 64 (45.71%) were in 0-1 year, 39 (26.97%) in 1-2 years, and 24 (17.14%) in 2-4 years and 13 (9.29%) in >4 yrs. age groups. Thus the incidence of gastrointestinal nematodes was found to be highest in between 0 month-1 year of age and least in above 4 years of age (Table 1). Similar observations were made by Singh et al. (2010), Tariq et al. (2010), Zeryehun (2012), Muluneh et al. (2014) and Nabi et al. (2014). Raza et al. observed 73% of gastrointestinal nematodes in kids compared to 40% in adult goats (2012). However, Admasu et al. (2014) reported incidence of gastrointestinal nematodes in relation to age of goats was non-significant and all ages of goats were prone to gastrointestinal nematodes infestations.

Table 1: Age-wise incidence of gastrointestinal nematodal infestation in goats (n=140)

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of goats examined</th>
<th>No. of animals positive for GI nematodes</th>
<th>Percent positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 month-1 year</td>
<td>140</td>
<td>64</td>
<td>45.71</td>
</tr>
<tr>
<td>Between 1-2 years</td>
<td>106</td>
<td>39</td>
<td>36.79</td>
</tr>
<tr>
<td>Between 2-4 years</td>
<td>70</td>
<td>24</td>
<td>34.29</td>
</tr>
<tr>
<td>&gt;4 years</td>
<td>52</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>368</td>
<td>140</td>
<td>38.04</td>
</tr>
</tbody>
</table>

Table 2: Sex-wise incidence of gastrointestinal nematodal infestation in goats (n=140)

<table>
<thead>
<tr>
<th>Sex</th>
<th>No. of goats examined</th>
<th>No. of animals positive for GI nematodes</th>
<th>Percent positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>188</td>
<td>75</td>
<td>39.89</td>
</tr>
<tr>
<td>Female</td>
<td>180</td>
<td>65</td>
<td>36.11</td>
</tr>
<tr>
<td>Total</td>
<td>368</td>
<td>140</td>
<td>38.04</td>
</tr>
</tbody>
</table>

Conclusion
The present study revealed prevalence of Strongyles spp. was higher than Trichuris spp. and Strongyloides spp.. Below 1 year aged animals had higher prevalence than others and male goats had higher prevalence than females. Proper preventive and control measures should be prepared based on these finding to control gastrointestinal nematodes in goats.

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References


